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For: ISOLATION SYSTEM WITH ANALOG COMMUNICATION ACROSS  
AN ISOLATION BARRIER

1           1.       An isolation system with analog communication across an isolation barrier  
2 comprising:  
3                   an isolation barrier circuit having at least one isolation element;  
4                   a digital to analog circuit having an analog output connected to the  
5 isolation barrier and an input for receiving an input digital signal to be communicated across  
6 the isolation barrier; and  
7                   an analog to digital circuit having an input coupled to the analog  
8 output of the isolation barrier circuit for providing a digital output signal.

1           2.       The isolation system of claim 1 in which said digital to analog circuit  
2 includes an encoder circuit responsive to said input digital signal to provide a digital signal,  
3 and a digital to analog converter responsive to said digital signal to provide to said isolation  
4 barrier said analog output signal.

1           3.       The isolation system of claim 1 in which said digital to analog circuit  
2 includes a digital to analog converter with an input for receiving said input digital signal and  
3 a modulation circuit responsive to said digital to analog converter for providing said analog  
4 output.

1           4.       The isolation system of claim 1 in which said analog to digital circuit  
2 includes an analog to digital converter responsive to said input analog signal from said

3 isolation barrier to provide a digital signal, and a decoder circuit responsive to said digital  
4 signal to provide said digital output response.

1 5. The isolation system of claim 1 in which said analog to digital circuit  
2 includes a demodulator circuit responsive to said input analog signal from said isolation  
3 barrier, and an analog to digital converter responsive to said analog signal to provide said  
4 digital output signal.

1 6. The isolation system of claim 1 in which said analog to digital circuit  
2 includes an analog to digital converter.

1 7. The isolation system of claim 1 in which said digital to analog circuit  
2 includes a digital to analog converter.

1 8. The isolation system of claim 1 in which said digital to analog circuit  
2 includes a termination resistance connected with said isolation barrier.

1 9. The isolation system of claim 1 in which said analog to digital circuit  
2 includes a termination resistance connected with said isolation barrier.

1 10. The isolation system of claim 1 in which said isolation element includes a  
2 capacitance.

1           11.     The isolation system of claim 1 in which said isolation element includes a  
2     transformer.

1           12.     The isolation system of claim 1 in which said analog to digital circuit  
2     includes a common mode interference signal sensing circuit and a summing circuit for  
3     removing the common mode interference signal from the received analog signal from the  
4     isolation barrier.

1           13.     The isolation system of claim 1 in which said digital signal to be  
2     communicated across said isolation barrier includes data.

1           14.     The isolation system of claim 1 in which said digital signal to be  
2     communicated across said isolation barrier includes control information.

1           15.     The isolation system of claim 14 in which said digital signal to be  
2     communicated across said isolation barrier includes reference and calibration information.

1           16.     The isolation system of claim 1 in which said digital signal to be  
2     communicated across said isolation barrier includes data and control information.

1           17.     The isolation system of claim 2 in which the signal is a constant average  
2     signal.

1 18. The isolation system of claim 3 in which the signal is a constant average  
2 signal.

1 19. The isolation system of claim 4 in which the signal is a constant average  
2 signal.

1 20. The isolation system of claim 5 in which the signal is a constant average  
2 signal.

1 21. A bi-directional isolation system with analog communication across an  
2 isolation barrier comprising:

3 an isolation barrier circuit having at least one isolation element;

4 a first digital to analog circuit having an analog output coupled to a  
5 first side of the isolation barrier and an input for receiving an input digital signal to be  
6 communicated across the isolation barrier;

7 a first analog to digital circuit having an input coupled to the first  
8 side of the isolation barrier circuit;

9 a second digital to analog circuit having an analog output coupled to  
10 a second side of the isolation barrier and an input for receiving an input digital signal to be  
11 communicated across the isolation barrier; and

12 a second analog to digital circuit having an input coupled to the  
13 second side of the isolation barrier circuit.

1           22.     The bi-directional isolation system of claim 21 in which the input digital  
2 signals are communicated simultaneously across the isolation barrier circuit.

1           23.     The bi-directional isolation system of claim 21 in which the input digital  
2 signals are communicated alternately across the isolation barrier circuit.

1           24.     The bi-directional isolation system of claim 21 further including at least one  
2 echo cancellation circuit for removing a local echo signal from the input of at least one of  
3 said first and second analog to digital circuits.